

2.6. Disease and pest control:

Rice blast is the major disease. Seed dressing with tricyclazol or triconazol gives protection for 40 – 60 days. It may be needed to give one foliar spray also. Consult you local agriculture officer for suitable fungicide for your area. Stem borer, root aphids, termites are effectively controlled by basal application of carbofuran.

2.7. Harvesting :

Harvest when more than 95% plants are mature. It may be needed to provide protection against birds at harvesting stage. Leave the border rows and select the seeds from middle rows for storage. Store seeds after proper sun drying in a dry place. Label seeds properly.

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Rice Seed Production Manual *under* IRRI Project



2008
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Meghalaya

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Published by :

Director
ICAR (RC) for NEH Region
Umiam – 793 103, Meghalaya
Ph./Fax : 0364 – 2570011

Cover Photo

Seed production programme at Farmer's field.

Printed by

En-Em Solutions, Umsohsun Road, Shillong - 793001
Contact No. 9862876944, 9863028258

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Rice Seed Production Manual

1.0. Irrigated Rice

In most areas under assured irrigation or having plenty of water, transplanting is done using seedlings raised in nurseries. Only in a limited area, the practice of direct seeding of pre-germinated rice is followed. Use paddy row seeder for effective direct seeding in puddled soils.

The details on raising nursery and crop production methods are described below :-

1.1. Nursery

Seedlings can be raised using wet nursery or dry nursery. Dry nursery is recommended on hills.

Wet nursery

Prepare the seed bed 35 - 40 days prior to the scheduled transplanting time. Plough the field twice in the dry condition and puddle later in standing water (2-3 cm) two to three times within 5 days. Level the field perfectly and prepare seedbeds of 3.0 m width and of convenient length leaving 30 cm channels in between beds. Total seedbed area is normally 10% of the main field to be transplanted. For every 1000 m² area of the seedbed, apply nitrogen (5 to 10 kg N), phosphorous (5 kg P₂O₅) and potash (5 kg K₂O) fertilizers. Apply double dose of phosphorus fertilizer, in areas exposed to cool temperatures in the hills and during rabi.

Select seeds for sowing using the common salt solution (1.65 kg common salt in 10 L water). Put seeds in salt solution and discard all floating seeds. Wash the seeds settled at the bottom thoroughly with water and dry seeds in the sun if sowing is to be done at a later date. For raising seedlings sufficient to transplant one hectare, use 50 to 60 kg selected seeds and sow in 1000 m² seedbed area. Adopt seed dressing with a systemic fungicide available in your area. Soak seeds for 24 hours in water. Put the soaked seeds in jute (gunny) bags and incubate for 48 hours beneath straw and keep the straw moist using water. Broadcast germinated seeds uniformly over the prepared seedbed.

In pest endemic areas, apply 1.0 kg a.i./ha carbofuran granules for the control of gall midge and stem borer. Alternatively, spray 0.5 kg a.i./ha monocrotophos or carbaryl @ 0.75 a.i./ha 10 days after sowing for the control of stem borer. Maintain water depth at 2 - 3 cm. Top-dress seedbed with 3 - 6 kg N/1000m² nursery area. Hand-weed once, if required, 15 days after seedling emergence. The seedlings would be ready for transplanting

in 25 - 30 days after germination. While uprooting the seedlings, ensure wetness of the soil to avoid root damage. Seedlings with damaged roots take more time to establish after transplanting.

Dry nursery

All the procedures for raising dry nursery are similar to that described for wet nursery excepting the following:

Plough the field 3-4 times at 5 days' interval on receipt of the first summer showers. Apply fertilizer mixture in furrows (lines) and mix well before sowing of seeds. Sow dry seeds in furrows (lines) at 20cm apart and cover with a thin layer of soil. Use herbicide, butachlor (1.0 kg a.i./ha) or hand-weed once 5-7 days after sowing. Irrigate the dry beds frequently if rain is infrequent. The seedlings would be ready for transplanting in 20 - 25 days after germination. Never uproot the seedlings when the nursery is totally dry and ensure wetness to avoid root damage.

1.2. Preparation of the main field

Dry plough the field three weeks before planting time and submerge by flooding with 5 - 10 cm of standing water. Add 10 tonnes of farm yard manure, or 10 - 20 tonnes of green manure (*Sesbania*, sunhemp, *Glyricidia* or cowpea) and incorporate by puddling. These green manure crops could be sown in pre-kharif season. Apply basally recommended fertilizers for your area before the last puddle and incorporate. Level fields well.

1.3. Fertilizer application

Use 60 - 80 kg nitrogen/ha, in three equal split doses. Apply one-third nitrogen as a basal dose and incorporate the nitrogen applied in soil. Apply one-third of nitrogen as top dress at early tillering stage. Apply the rest of nitrogen dose a week before panicle initiation. Drain out water before topdressing with nitrogen fertilizer and let in water 24 hours later. Add phosphorus and potash fertilizers as basal dose depending on the soil test value. Normally phosphorus (60 kg P₂O₅/ha) and potash (40 kg K₂O/ha) fertilizers are applied. Apply lime once in every three crop seasons for acid soils.

Use of *Azolla* can provide 20 - 25 kg N/ha. For growing *Azolla*, phosphorus and molybdenum are to be applied. Please consult an expert for dosage selection. Use 6.0 t/ha *Azolla* and incorporate before final puddling. Alternatively, *Azolla* can be grown in standing water in the main field by

inoculating 1.0 t/ha *Azolla* 7 days after planting. This will form a mat within 15 days and the *Azolla* can be incorporated in the soil by mulching.

1.4. Transplanting

Level the main field after fertilizer application and maintain a thin film of water. Transplant 30 - 35 days old seedlings (4-5 leaf stage) from wet or dry bed nursery. Plant at shallow depth of 3-4 cm. with 2 seedlings per hill. Plant at 10cm (plant to plant) x 20cm (row to row) spacing. Fill gaps twice; one week after planting and again 15 days later. Wherever planting is delayed or old seedlings are used, plant 5-6 seedlings/hill. Also ensure 25% extra plant population by planting at a closer spacing. More care may be needed in fertilizer application and managing pests. Apply butachlor granules (1kg a.i./ha) one day after transplanting.

1.5. Water management

Proper water management facilitates good tillering in the crop, increases efficiency of nitrogen use by plants and helps to reduce weed population. Maintain 2-5 cm water throughout the growing season. Drain out water before topdressing with nitrogen fertilizer and let in water 24 hours later. Depending on the soil type, drain out water 15 – 20 days after 50% flowering. This ensures fast ripening of the grains.

1.6. Weed control and interculture

Adopt hand weeding 2-3 times at 20 days interval starting from 20 days after planting. This is done before the top dressing of urea. Wherever weed problem is acute, selectively apply selective herbicides after the seed germination and before emergence of the weeds.

Apply Butachlor @ 1.5-2.0 kg/ha at the time of transplanting (pre-emergence) followed by hand weeding at 25-30 days after transplanting. If weeds are grown up, application of 24-D sodium salt @ 0.75-1.00 kg/ha at 20-25 days after sowing or transplanting gives satisfactory control of weeds. Application of herbicides should be followed by one hand weeding 20 days after weeding. Visit field regularly and rouge off all off type plants as and when detected.

1.7. Diseases and insect pest management

Adopt need-based application of pesticides.

1.8. Harvesting :

Harvest when more than 95% plants are mature. It may be needed to provide protection against birds at harvesting stage. Leave the border rows and

select the seeds from middle rows for storage. Store seeds after proper sun drying in a dry place. Label seeds properly.

2.0. RAINFED UPLAND RICE :

2.1. Land Preparation

With the initial summer rainfall, prepare the field. Plough the field well. Use the disc harrow twice. Apply farm yard manure at 10 t/ha. Apply lime every 3 years. Determine dosage after soil testing. Furrow application of lime will reduce lime requirement. Ensure proper leveling of the field before sowing. Make uniform rows at 25cm distance. Use a row marker for making shallow furrows (rows). Apply basal dose of fertilizer (20 kg N, 60kg P, 40 kg K / ha) and carbofuran granule (1kg a.i. / ha) in furrows before seeding and mix well.

2.2. Seed selection :

Select seeds using common salt solution as described earlier.

2.3. Seed rate and sowing :

Use 60 – 80 kg seeds per hectare. Treat seeds with a systemic fungicide (consult agriculture officer of your locality for brand name) overnight. Sow seeds thinly in furrows and cover with soil. Irrigate the field if the soil is very dry and rain is not expected within 2 – 3 days. Spray butachlore (1kg a.i./ha) 2 days after sowing (or irrigation after sowing). In some areas it may be needed to cover the soil with net or grass to avoid damage by birds. Thin / fill gap 12 – 15 days after germination and maintain optimum plant population.

2.4. Fertilizer application :

Use 60 kg/ha nitrogen in three split dosages. Apply the first dose as basal dose, second as top dress at active tillering stage (40 – 45 days after germination) and the third just before panicle initiation. Phosphorus and potash fertilizers are applied as basal dose.

2.5. Interculture and weed control:

Adopt hand weeding or harrowing thrice at 20, 40 and 60 days after germination. Apply fertilizer only after weeding. A combination of chemical (2,4-D) sodium salt 80% @0.75-1.0 kg/ha and manual control will produce better results. Rouge all off type plants as and when detected.